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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WERNER, DAVID N	

ART UNIT	PAPER NUMBER
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,971	LIANG ET AL.	
	Examiner	Art Unit	
	DAVID N. WERNER	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-12,14-33 and 68-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-12,14-33 and 68-76* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 April 2004* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20080317, 20080606*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action for US Patent Application 10/826,971 is in response to communications filed 17 March 2008, in reply to the Non-Final Rejection of 14 September 2007. Currently, claims 1-5, 7-12, 14-33, and 68-76 are pending. Of those, claims 68-76 are new.

2. In the previous Office action, claims 1-5 were rejected under 35 U.S.C. 101 as inoperative. Claims 1-5 were rejected under 35 U.S.C. 112, first paragraph, as not enabled by the specification. Claims 1-33 were rejected under 35 U.S.C. 102(b) based on a public use of the invention.

Information Disclosure Statement

3. The information disclosure statements filed 17 March 2008 and 06 June 2006 fail to comply with the provisions of 37 CFR 1.98(b)(5) and MPEP § 609 because the documents cited therein are not identified by publication date including at least month and year. They have been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in these information disclosure statements or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Response to Amendment

4. The declaration under 37 CFR 1.132 filed 17 March 2008 is sufficient to overcome the rejection of claims 1-33 based upon an alleged public use of the invention more than one year prior to the filing date of the present application.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-5, 7-12, 14-21, 23, 24, 29, 30, and 68-70 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The relevant portions of the USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Section IV.C, reads as follows:

> While abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be. In evaluating whether a claim meets the requirements of section 101, the claim must be considered as a whole to determine whether it is for a particular application of an abstract idea, natural phenomenon, or law of nature, rather for the abstract idea, natural phenomenon, or law of nature itself.
>
> "...claims directed to nothing more than abstract ideas (such as mathematical algorithms), natural phenomena, and laws of nature are not eligible for and therefore excluded from patent protection..."
>
> "While a scientific truth, or mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be"
>
> "One may not patent a process that comprises every 'substantial practical application' of an abstract idea, because a patent 'in practical effect would be a patent on the [abstract idea] itself..."

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 2583-84, 32 USPQ2d at 1035.
>
> Claims that recited nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, *per se*, and as such are nonstatutory natural phenomena. See *O'Reilly*, 56 U.S. (15 How.) at 112-114. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.
>
> ...a signal does not fall within one of the four statutory classes of Sec. 101.
>
> ...signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

Lines 2-4 of independent claims 1 and 68 define nothing more than a mathematical algorithm, that by itself, is a Judicial Exception (i.e., non-statutory). Judicial Exceptions may be statutory if they recite a practical application, or they are part of an otherwise statutory claim, *and* if the claimed practical application does not "preempt" the Judicial Exception. While claims 1 and 68 appear to broadly recite a practical application of the algorithm, as they recite “outputting a result”, such a broad application preempts the algorithm because in effect, it recites every “substantial practical application” thereof. Therefore, claims 1 and 68, and dependent claims 2-12, 14-21, and 69-70, are rejected as non-statutory as preempting a mathematical algorithm.

Independent claims 22 and 28, in contrast, are tied to “a video processing tool”, which is a "machine" or "manufacture" under section 101, and so are statutory. See *Parker v. Flook*, 437 U.S. 584, 198 USPQ 193 (1978), "[the Supreme Court] has only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a ‘different state or thing’".

Claims 2, 3, 23, 24, 29, and 30 are drawn to a "storage medium" encoding functional descriptive material. Normally, the claims would be statutory. However, the specification, at page 14: lines 9-12, defines the claimed storage medium as encompassing statutory material such as "magnetic disks" and "CD-ROMs", as well as **"any other medium"**, which encompasses both the statutory media described within the paragraph, as well as non-statutory signal or carrier wave media such as the "communication" medium described in page 14: lines 22-28.

A signal embodying functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the statutory classes of §101. Rather, a "signal" is a form of energy, in the absence of any physical structure or tangible material. See *In re Nuijten*, 84 USPQ2d 1495 (Fed. Cir. 2007, *en banc* denied 2008, *writ of cert. pending*). Because the full scope of the claims as properly read in light of the disclosure encompasses non-statutory subject matter, the claims as a whole are non-statutory.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-5, 7-12, 14-33, and 68-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 4,420,771 (Pirsch), cited in the 17 March 2008 Information Disclosure Statement in view of US Patent 5,668,547 A (Lee). Pirsch teaches a run-level coder in which further variable-length coding is performed on runs and levels. Regarding independent claims 1 and 22, Lee performs coding on "frequent-value runs" of a pre-determined value and "non-frequent-value runs" of other values (column 1: lines 63-68). This corresponds with the claimed step of processing plural first-layer runs. The processed variable-length codes in Pirsch are then transmitted (column 2: lines 7-9), which corresponds with the claimed step of "outputting a result". However, as shown in tables 2-3 of Pirsch, although specific runs are given variable-length coding, these are not run-level codes themselves (column 7: lines 5-48).

Lee teaches an advanced run-length coding system for a digital video coder, such as the "processing tool" of claim 22. Regarding claims 1 and 22, Lee describes the use of run-level coding as a variable-length code of a sequence of data (column 1: lines 35-64), followed by an advanced method of further removing any remaining redundancy in the run-level coded data, such as from a repeated run, level pair (column 2: lines 5-34. By substituting the run-level coding system of Lee for the custom VLC tables of runs and levels of Pirsch, the present invention is achieved.

Pirsch discloses the claimed invention except for performing second-layer run-level coding on runs. Lee teaches that it was known to perform run-level coding as an efficient variable-length coding technique and that it was known to further compress a first-layer run-level code. Therefore, it would have been obvious to one having ordinary

skill in the art at the time the invention was made to incorporate the coding system of Lee into the coder of Pirsch, since Lee states in column 1: lines 58-63 that such a modification would "greatly reduce the amount of data" by performing run-level compression, while still eliminating further redundancies of run-level pairs.

Regarding claims 4 and 5, Lee operates on DCT blocks of pixels that have been zigzag scanned (column 1: lines 23-34).

Regarding claims 7, 25, and 26, in Pirsch, a distinction is made between "frequent" values, and "non-frequent" values (column 2: lines 26-49), and Lee shows that typically in video coding, a zero value is distinguished from non-zero values (column 1: lines 30-57). Pirsch additionally explicitly shows coding performed on runs of value zero, considered a "significant value" in the present invention (column 7: lines 5-35).

Regarding claims 8 and 27, Pirsch shows further variable-length coding of runs of value one (column 7: lines 5-24, 38-48), which is a non-zero, "insignificant" value

Regarding claim 9, table 2 of Pirsch shows a unique code word for each length of a zero-value, or "significant-value" run.

Regarding claims 10, 11, 20, and 21, Pirsch teaches that it was known to perform Huffman coding on the output of run-level data (column 7: lines 49-54).

Regarding claim 12, the additional processing in Lee to reduce redundancies in run-level pairs (column 4: lines 12-43) corresponds with the claimed step of "processing a count of significant second-layer runs".

Regarding claims 69 and 71, in Pirsch, the "transmission" of an encoded signal (column 2: line 8) corresponds with the claimed bit stream output signal.

Regarding claims 70 and 72, in Pirsch, the "recovering" of an original signal (column 2: line 9) corresponds with the claimed reconstruction of video pictures for display.

Regarding claims 2, 3, 23, and 24, although Pirsch and Lee are directed to hardware implementations, the examiner takes Official Notice that it would have been obvious to one having ordinary skill in the art at the time of the present invention to implement a software variable-length coder or decoder for digital video, such as those found in common software implementations of standard video codecs such as the MPEG family or the H26x family.

Regarding independent claims 28 and 68, Pirsch describes performing processing on the "magnitudes or values or values of words which make up the non-frequent value runs", including further variable-length coding (column 2: lines 1-3). This corresponds with the claimed step of "processing run-level information" in the present invention.

Regarding claims 14, 15, and 31, the coded values of levels in Pirsch are the "non-frequent" values (column 2: line 2), which are considered non-zero or "insignificant" according to the present invention.

Regarding claim 16, table 4 of Pirsch shows a unique code for each non-zero value.

Regarding claims 17 and 18, Pirsch teaches that it was known to perform Huffman coding on the output of run-level data (column 7: lines 49-54).

Regarding claim 19, the additional processing in Lee to reduce redundancies in run-level pairs (column 4: lines 12-43) corresponds with the claimed step of "processing a count of significant second-layer levels".

Regarding claims 29 and 30, although Pirsch and Lee are directed to hardware implementations, the examiner takes Official Notice that it would have been obvious to one having ordinary skill in the art at the time of the present invention to implement a software variable-length coder or decoder for digital video, such as those found in common software implementations of standard video codecs such as the MPEG family or the H26x family.

Regarding claim 32, in Pirsch, Table 3 shows a special coding for runs of a level of value one.

Regarding claim 33, in Pirsch, Table 4 shows a coding in which each "non-frequent value" has a unique coding.

Regarding claims 73 and 75, in Pirsch, the "transmission" of an encoded signal (column 2: line 8) corresponds with the claimed bit stream output signal.

Regarding claims 74 and 76, in Pirsch, the "recovering" of an original signal (column 2: line 9) corresponds with the claimed reconstruction of video pictures for display.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,256,064 B1 (Chujoh et al.) teaches a variable-length coding system in which codes for a scalable-layer compressed video are multiplexed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on MWF from 9:00-6:30, TR from 9:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. N. W./
Examiner, Art Unit 2621

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